

## Quadrupel dyadischer Relationen

1. Nicht nur die Zeichenklassen, sondern auch die in Toth (2026a) eingeführten dyadischen semiotischen Relationen können als Quadrupel erscheinen, d.h. als unmarkierte Relation, als konverse Relation, als Duale der unmarkierten Relation (vgl. Toth 2026b) und als Duale der konversen Relation. Man beachte in den folgenden Listen für alle vier Zeichenfunktionen die kombinatorischen Gleichheiten und Differenzen für die jeweiligen R, R<sup>-1</sup>, DR und DR<sup>-1</sup>.

### 2. Quadrupel dyadischer Relationen

#### 2.1. Z = f(M, O)

$$\left| \begin{array}{ccc} 1.1 & 1.2 & - \\ 2.1 & 2.2 & - \\ - & - & - \end{array} \right|$$

R = (1.1, 1.1)	R <sup>-1</sup> = (1.1, 1.1)	DR = (1.1, 1.1)	DR <sup>-1</sup> = (1.1, 1.1)
R = (1.1, 1.2)	R <sup>-1</sup> = (1.2, 1.1)	DR = (2.1, 1.1)	DR <sup>-1</sup> = (1.1, 2.1)
R = (1.1, 2.1)	R <sup>-1</sup> = (2.1, 1.1)	DR = (1.2, 1.1)	DR <sup>-1</sup> = (1.1, 1.2)
R = (1.1, 2.2)	R <sup>-1</sup> = (2.2, 1.1)	DR = (2.2, 1.1)	DR <sup>-1</sup> = (1.1, 2.2)
R = (1.2, 1.2)	R <sup>-1</sup> = (1.2, 1.2)	DR = (2.1, 2.1)	DR <sup>-1</sup> = (2.1, 2.1)
R = (1.2, 2.1)	R <sup>-1</sup> = (2.1, 1.2)	DR = (1.2, 2.1)	DR <sup>-1</sup> = (2.1, 1.2)
R = (1.2, 2.2)	R <sup>-1</sup> = (2.2, 1.2)	DR = (2.2, 2.1)	DR <sup>-1</sup> = (2.1, 2.2)
R = (2.1, 2.1)	R <sup>-1</sup> = (2.1, 2.1)	DR = (1.2, 1.2)	DR <sup>-1</sup> = (1.2, 1.2)
R = (2.1, 2.2)	R <sup>-1</sup> = (2.2, 2.1)	DR = (2.2, 1.2)	DR <sup>-1</sup> = (1.2, 2.2)
R = (2.2, 2.2)	R <sup>-1</sup> = (2.2, 2.2)	DR = (2.2, 2.2)	DR <sup>-1</sup> = (2.2, 2.2)

#### 2.2. Z = f(O,I)

$$\left| \begin{array}{ccc} - & - & - \\ 2.1 & 2.2 & 2.3 \\ - & 3.2 & - \end{array} \right|$$

R = (2.1, 2.1)	R <sup>-1</sup> = (2.1, 2.1)	DR = (1.2, 1.2)	DR <sup>-1</sup> = (1.2, 1.2)
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$R = (2.1, 2.2)$	$R^{-1} = (2.2, 2.1)$	$DR = (2.2, 1.2)$	$DR^{-1} = (1.2, 2.2)$
$R = (2.1, 2.3)$	$R^{-1} = (2.3, 2.1)$	$DR = (3.2, 1.2)$	$DR^{-1} = (1.2, 3.2)$
$R = (2.1, 3.2)$	$R^{-1} = (3.2, 2.1)$	$DR = (2.3, 1.2)$	$DR^{-1} = (1.2, 2.3)$
$R = (2.2, 2.2)$	$R^{-1} = (2.2, 2.2)$	$DR = (2.2, 2.2)$	$DR^{-1} = (2.2, 2.2)$
$R = (2.2, 2.3)$	$R^{-1} = (2.3, 2.2)$	$DR = (3.2, 2.2)$	$DR^{-1} = (2.2, 3.2)$
$R = (2.2, 3.2)$	$R^{-1} = (3.2, 2.2)$	$DR = (2.3, 2.2)$	$DR^{-1} = (2.2, 2.3)$
$R = (2.3, 2.3)$	$R^{-1} = (2.3, 2.3)$	$DR = (3.2, 3.2)$	$DR^{-1} = (3.2, 3.2)$
$R = (2.3, 3.2)$	$R^{-1} = (3.2, 2.3)$	$DR = (2.3, 3.2)$	$DR^{-1} = (3.2, 2.3)$
$R = (3.2, 3.2)$	$R^{-1} = (3.2, 3.2)$	$DR = (2.3, 2.3)$	$DR^{-1} = (2.3, 2.3)$

### 2.3. $Z = f(M, I)$

$\left  \begin{array}{ccc} 1.1 & 1.2 & 1.3 \\ - & - & - \\ 3.1 & - & - \end{array} \right $
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$R = (1.1, 1.1)$	$R^{-1} = (1.1, 1.1)$	$DR = (1.1, 1.1)$	$DR^{-1} = (1.1, 1.1)$
$R = (1.1, 1.2)$	$R^{-1} = (1.2, 1.1)$	$DR = (2.1, 1.1)$	$DR^{-1} = (1.1, 2.1)$
$R = (1.1, 1.3)$	$R^{-1} = (1.3, 1.1)$	$DR = (3.1, 1.1)$	$DR^{-1} = (1.1, 3.1)$
$R = (1.1, 3.1)$	$R^{-1} = (3.1, 1.1)$	$DR = (1.3, 1.1)$	$DR^{-1} = (1.1, 1.3)$
$R = (1.2, 1.2)$	$R^{-1} = (1.2, 1.2)$	$DR = (2.1, 2.1)$	$DR^{-1} = (2.1, 2.1)$
$R = (1.2, 1.3)$	$R^{-1} = (1.3, 1.2)$	$DR = (3.1, 2.1)$	$DR^{-1} = (2.1, 3.1)$
$R = (1.2, 3.1)$	$R^{-1} = (3.1, 1.2)$	$DR = (1.3, 2.1)$	$DR^{-1} = (2.1, 1.3)$
$R = (1.3, 1.3)$	$R^{-1} = (1.3, 1.3)$	$DR = (3.1, 3.1)$	$DR^{-1} = (3.1, 3.1)$
$R = (1.3, 3.1)$	$R^{-1} = (3.1, 1.3)$	$DR = (1.3, 3.1)$	$DR^{-1} = (3.1, 1.3)$
$R = (3.1, 3.1)$	$R^{-1} = (3.1, 3.1)$	$DR = (1.3, 1.3)$	$DR^{-1} = (1.3, 1.3)$

### 2.4. $Z = f(M, O, I)$

$\left  \begin{array}{ccc} 1.1 & 1.2 & 1.3 \\ 2.1 & 2.2 & 2.3 \\ 3.1 & 3.2 & 3.3 \end{array} \right $
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$R = (1.1, 1.1)$	$R^{-1} = (1.1, 1.1)$	$DR = (1.1, 1.1)$	$DR^{-1} = (1.1, 1.1)$
$R = (1.1, 1.2)$	$R^{-1} = (1.2, 1.1)$	$DR = (2.1, 1.1)$	$DR^{-1} = (1.1, 2.1)$
$R = (1.1, 1.3)$	$R^{-1} = (1.3, 1.1)$	$DR = (3.1, 1.1)$	$DR^{-1} = (1.1, 3.1)$
$R = (1.1, 2.1)$	$R^{-1} = (2.1, 1.1)$	$DR = (1.2, 1.1)$	$DR^{-1} = (1.1, 1.2)$
$R = (1.1, 2.2)$	$R^{-1} = (2.2, 1.1)$	$DR = (2.2, 1.1)$	$DR^{-1} = (1.1, 2.2)$
$R = (1.1, 2.3)$	$R^{-1} = (2.3, 1.1)$	$DR = (3.2, 1.1)$	$DR^{-1} = (1.1, 3.2)$
$R = (1.1, 3.1)$	$R^{-1} = (3.1, 1.1)$	$DR = (1.3, 1.1)$	$DR^{-1} = (1.1, 1.3)$
$R = (1.1, 3.2)$	$R^{-1} = (3.2, 1.1)$	$DR = (2.3, 1.1)$	$DR^{-1} = (1.1, 2.3)$
$R = (1.1, 3.3)$	$R^{-1} = (3.3, 1.1)$	$DR = (3.3, 1.1)$	$DR^{-1} = (1.1, 3.3)$
$R = (1.2, 1.2)$	$R^{-1} = (1.2, 1.2)$	$DR = (2.1, 2.1)$	$DR^{-1} = (2.1, 2.1)$
$R = (1.2, 1.3)$	$R^{-1} = (1.3, 1.2)$	$DR = (3.1, 2.1)$	$DR^{-1} = (2.1, 3.1)$
$R = (1.2, 2.1)$	$R^{-1} = (2.1, 1.2)$	$DR = (1.2, 2.1)$	$DR^{-1} = (2.1, 1.2)$
$R = (1.2, 2.2)$	$R^{-1} = (2.2, 1.2)$	$DR = (2.2, 2.1)$	$DR^{-1} = (2.1, 2.2)$
$R = (1.2, 2.3)$	$R^{-1} = (2.3, 1.2)$	$DR = (3.2, 2.1)$	$DR^{-1} = (2.1, 3.2)$
$R = (1.2, 3.1)$	$R^{-1} = (3.1, 1.2)$	$DR = (1.3, 2.1)$	$DR^{-1} = (2.1, 1.3)$
$R = (1.2, 3.2)$	$R^{-1} = (3.2, 1.2)$	$DR = (2.3, 2.1)$	$DR^{-1} = (2.1, 2.3)$
$R = (1.2, 3.3)$	$R^{-1} = (3.3, 1.2)$	$DR = (3.3, 2.1)$	$DR^{-1} = (2.1, 3.3)$
$R = (1.3, 1.3)$	$R^{-1} = (1.3, 1.3)$	$DR = (3.1, 3.1)$	$DR^{-1} = (3.1, 3.1)$
$R = (1.3, 2.1)$	$R^{-1} = (2.1, 1.3)$	$DR = (1.2, 3.1)$	$DR^{-1} = (3.1, 1.2)$
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## Literatur

Toth, Alfred, Eine Semiotik aus dyadischen Relationen. In: Electronic Journal for Mathematical Semiotics, 2026a

Toth, Alfred, Rejektionswerte aus dualen Dyaden. In: Electronic Journal for Mathematical Semiotics, 2026b

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